The City of Norfolk's Program to Manage Beaches & Sand Dunes

History

- Norfolk is the only jurisdiction where sand dune regulation resides in the same office that is responsible for dune management. We "talk the talk and walk the walk".

- Prior to 1982, the City's efforts to stabilize dunes were largely unsuccessful due to a lack of familiarity with dune processes and plants.

- Over the last 32 years, our office has undertaken numerous projects in consultation with VIMS and in adherence to best practices in North Carolina Sea Grant's, The Dune Book and US Army Corps of Engineers research publications.

- Our office has conducted field experiments on growing Atlantic Coastal Panic Grass from seed, transplanting of Sea Oats, plant diversity assessments, understanding and managing the American Beach grass “die-out phenomenon”, modifying techniques to install sand fencing, “corduroy road” construction, etc.

- Our office has an annual CIP budget of $100,000 to mitigate sand dune problems, plant dune vegetation, and undertake other sand dune management activities.

- Our office is a recognized leader in the Commonwealth on invasive dune plants. We were the only local government representative and speaker from Virginia at a national conference on Japanese Sedge. We spearheaded the eradication of Beach Vitex in Norfolk.

- Our office ***designed and supervised the construction*** of the sand dune system in East Beach – a project that has been awarded the “Best of the Best” Restored Beach in the Northeast by the American Shore and Beach Preservation Association.

- Our office created a comprehensive Beach and Dune Management Guidance Document that has been formally adopted by City Council and serves as a state and national model.

- Our office developed the Native Plants for Dune Restoration and Habitat Diversity. This publication is the only one we are aware of that lists both native dune plants and nurseries or vendors that sell them.

The Coastal Landscape

- Whereas most of Norfolk's tidal wetlands are privately owned, almost all of Norfolk's sand dunes are public.

- Norfolk's dune system is oriented east-west. Most dune systems on the East Coast are north-south.

- Data from a City-owned wave gage, documented an 18-foot high wave in the Chesapeake Bay off of Ocean View during a nor'easter on November 22, 2006.

- All of Norfolk's Chesapeake Bay shoreline is eroding. Without periodic nourishment, the beach and sand dune system would disappear.

The Science

- **Norfolk's shoreline is unique and our dune management strategies reflect that. We have learned through experience that what's appropriate elsewhere often does not work here.**

- Sand fencing is best used to control people, not to capture sand. (The Dune Book, pages 21-23)

- Stable, well-vegetated sand dunes grow towards the water, not landward. (The Dune Book, page 19)

- Almost all problems with sand dunes can be traced to a human cause.


4361
3 4 '86


11/13/2009


11/17/2009

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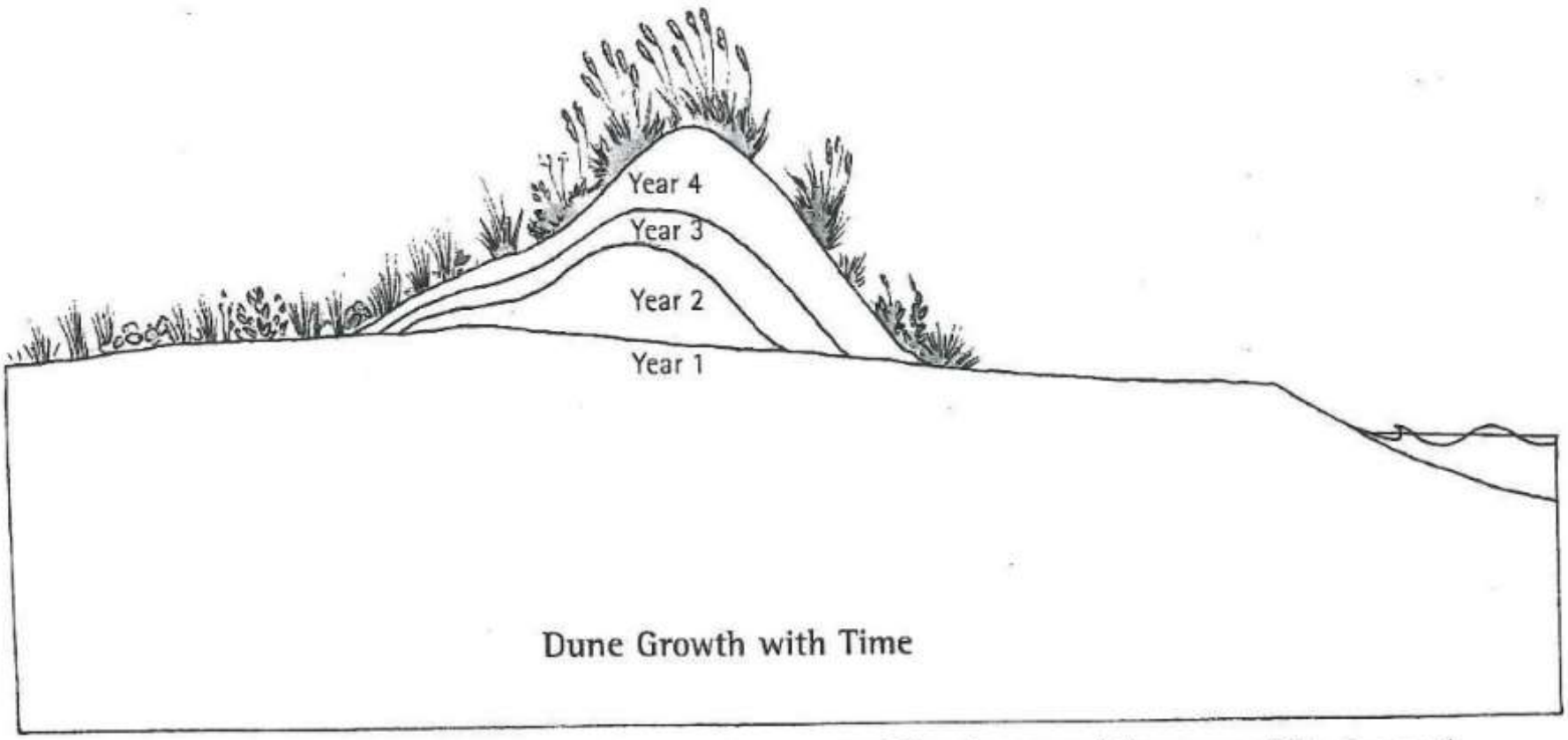

Figure M: Dune width and height increase each season in a seaward direction toward the source of blowing sand. Vegetation and dune height prevent sand from reaching the rear of dune.

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05/06/2008


11/13/2009

Dune Management Goals

- Protect, enhance and maintain a continuous dune line from the tip of Willoughby Spit to the Little Creek Channel.
- Keep sand from migrating out of the primary sand dune system.
- Provide sand dune education workshops and speak to civic leagues on a regular basis.
- Seek opportunities to remove old buildings and structures that are too close to the Bay and restore the area to a primary sand dune. Examples include: East Beach, Bay Oaks I & II, Breakers Motel, Traveler's Inn, and Pinewell by-the-Bay).


09 20 2003


Hurricane Isabel Damage –
19th Bay & Bay Oaks
09 19 2003


9/19/03


Lea View
Willoughby Beach
700-900 WOV
Chesapeake Bay
I-64 Exit 272
64
I-64 Exit 273
I-64 Exit 273
60
Hampton Roads
Central OV
168
Ocean View
E Ocean View Ave
A St
Bellinger Blvd
I-64 Exit 274
Modoc Ave
Bay View Beach
Merrimack Park
460
Oceanair
Devon St
Northside
Tidewater Dr
194
60
East Beach
Norfolk NAS / Chambers Field
Brookfield Park
East Ocean View
Are St
Sunset Dr
Pleasant Ave
Larrymore Acres
Colonial Heights
564
64
I-64 Exit 276


1978

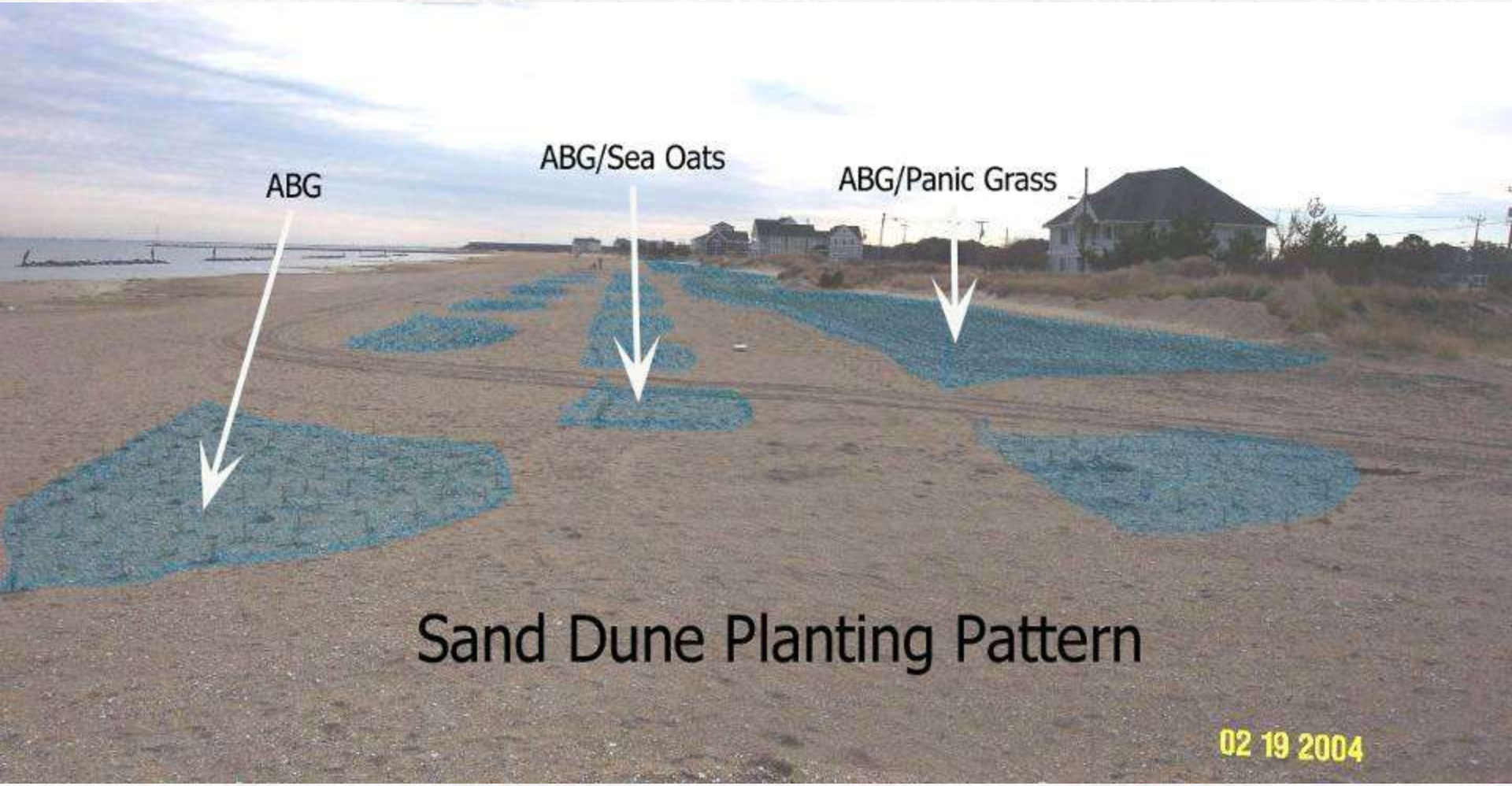

Ships Cabin


9 13 '85


2 12'98


200 Feet
NEW BEACH
150 Feet
120 Feet
NEW DUNE
24th Bay
25th Bay
26th Bay

Photo by VIMS Shoreline Studies


ABG
ABG/Sea Oats
ABG/Panic Grass
Sand Dune Planting Pattern
02 19 2004


02 25 2004


02 25 2004


02 19 2004


02 19 2004


02 25 2004


East Beach in 1978
Photo: City of Norfolk


02 25 2004

Photo by VIMS Shoreline Studies

One of the Best Restored Beaches in the U.S. in 2007

"Best of the Best" Restored Beach in the Northeast in 2012


Lea View
Willoughby Beach
700-900 WOV
Chesapeake Bay
I-64 Exit 272
64
I-64 Exit 273
I-64 Exit 273
60
Hampton Roads
Central OV
168
Ocean View
E Ocean View Ave
A St
Bellinger Blvd
I-64 Exit 274
Modoc Ave
Bay View Beach
Merrimack Park
460
Oceanair
Devon St
Northside
Tidewater Dr
194
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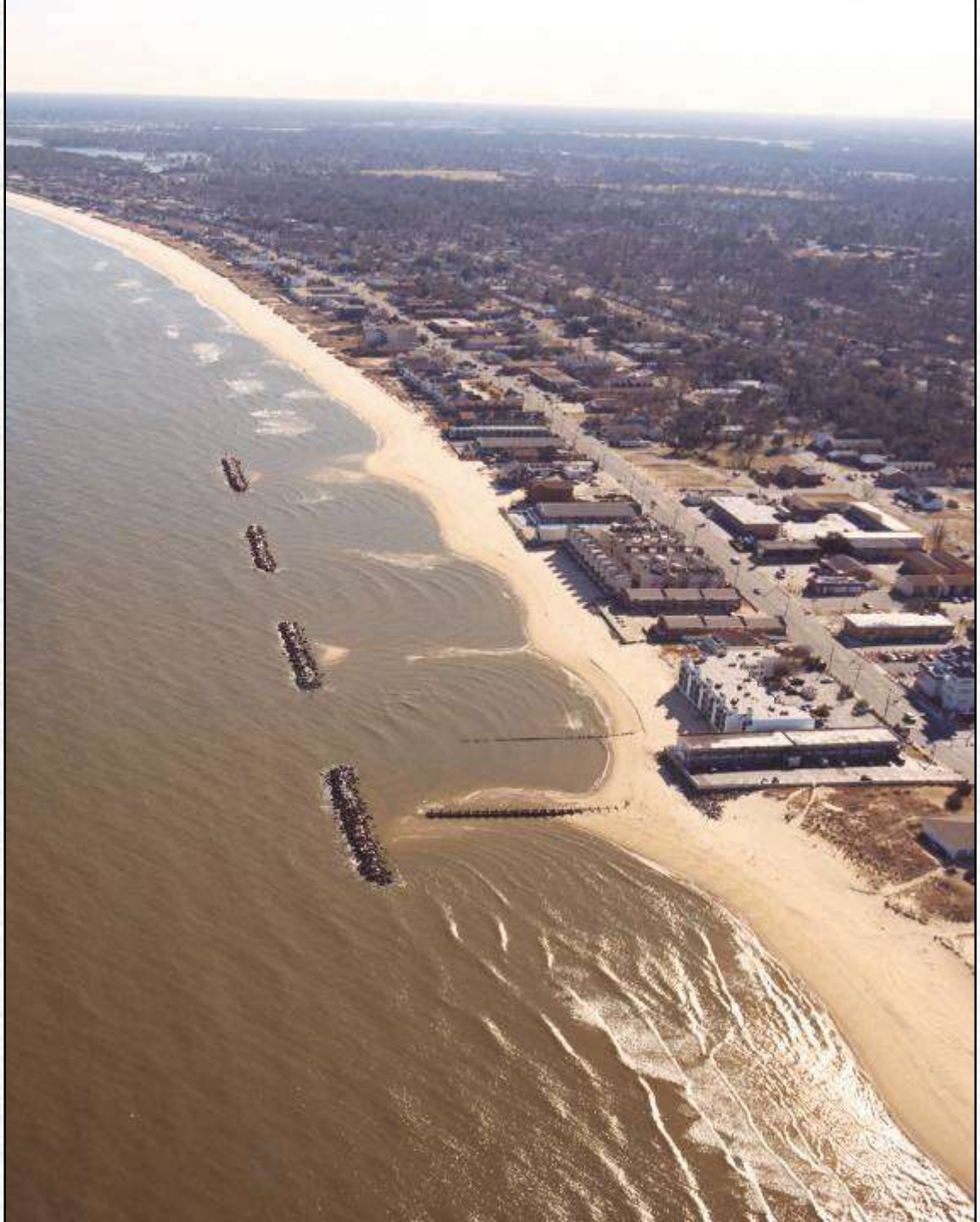
East Beach
Norfolk NAS / Chambers Field
Brookfield Park
East Ocean View
Are St
Sunset Dr
Pleasant Ave
Larrymore Acres
Colonial Heights
564
64
I-64 Exit 276




New Dune


'92 1 10

19th Bay & Bay Oaks


Lea View
Willoughby Beach
700-900 WOV
Chesapeake Bay
I-64 Exit 272
64
I-64 Exit 273
I-64 Exit 273
60
Hampton Roads
Central OV
168
Ocean View
E Ocean View Ave
A St
Bellinger Blvd
I-64 Exit 274
Modoc Ave
Bay View Beach
Merrimack Park
460
Oceanair
Devon St
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Tidewater Dr
194
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Norfolk NAS / Chambers Field
Brookfield Park
East Ocean View
Are St
Sunset Dr
Pleasant Ave
Larrymore Acres
Colonial Heights
564
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I-64 Exit 276

07 08 2005


Lea View
Willoughby Beach
700-900 WOV
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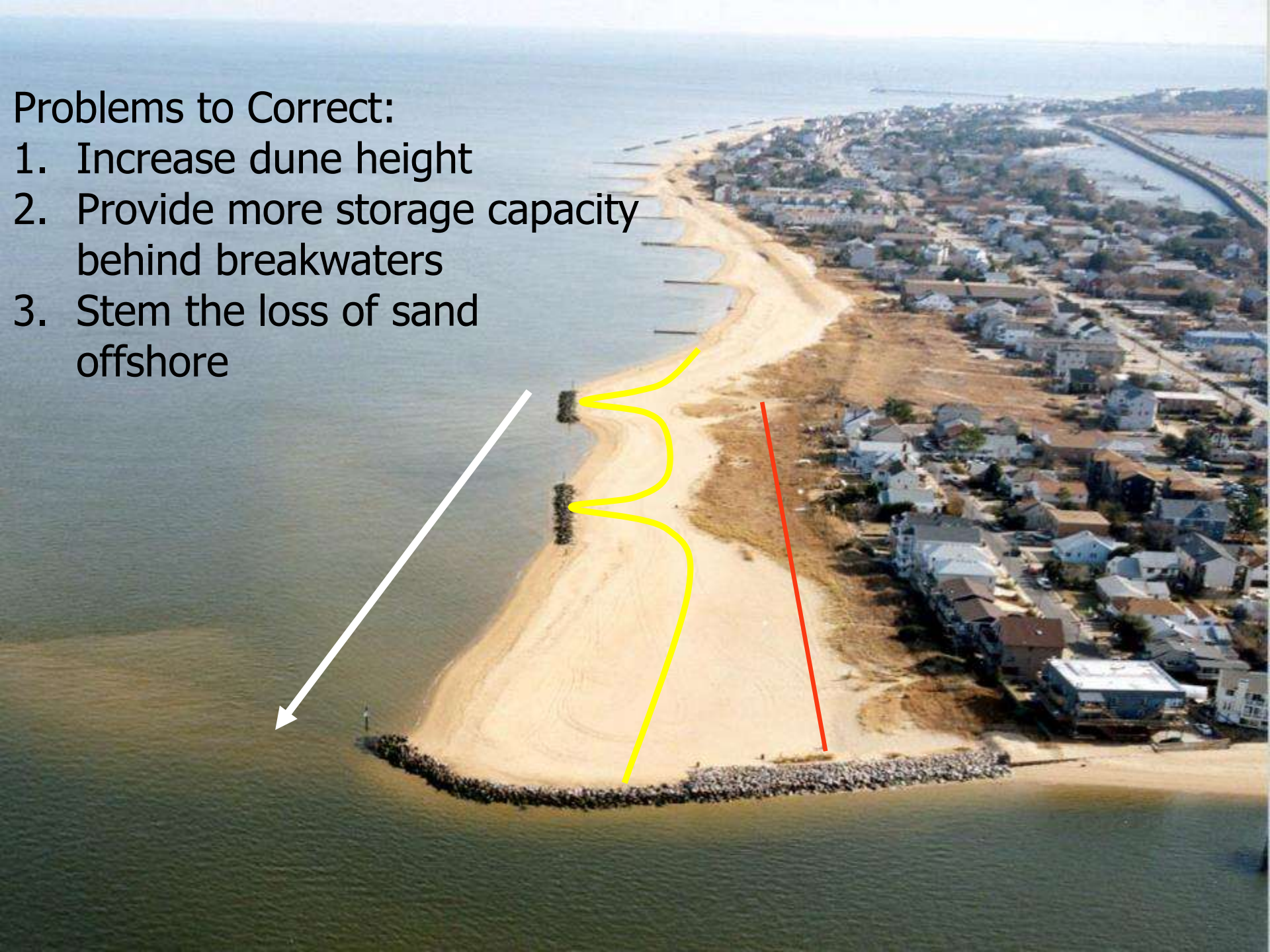
Colonial Heights
564
64
I-64 Exit 276

Lea View Ave. - After the Ash Wednesday Storm of 1962


1978

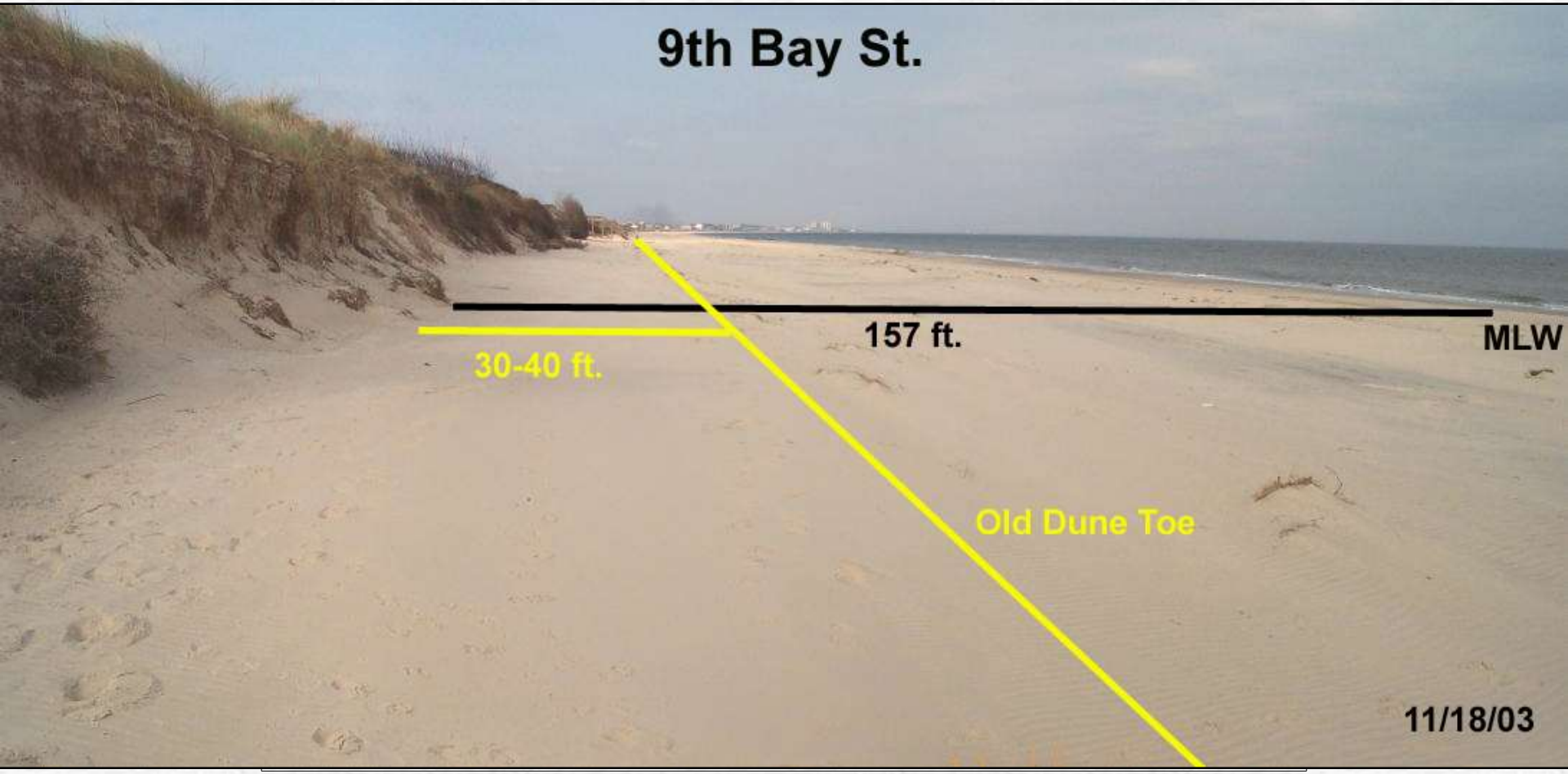

2003


Problems to Correct:
1. Increase dune height
2. Provide more storage capacity behind breakwaters
3. Stem the loss of sand offshore

Cottage Line Dunes

- Issue – Dunes are growing very tall at the crest
- Reason – Accelerated dune “rollup” is occurring by way of aeolian sand transport.
- Solution – Replanting dune foreslope after storm erosion will grow the dune wider, not higher.
- Result – Three years of active planting has worked.


11/20/2002


9th Bay St.
157 ft.
MLW
30-40 ft.
Old Dune Toe
11/18/03

Cottage Line Dunes

- Issue – Sand encroachment on private properties
- Reasons – Lack of dune vegetation, beach access induced dune blow-outs, homes located too close to the active dune zone.
- Solution – Dune grass planting, narrow on-grade walkways or sand trails, stairs (when high traffic or steep profiles).
- Results – Ongoing effort.


4 3 '85


'87 1 16


'87 1 16


'87 1 16


10 7 '85

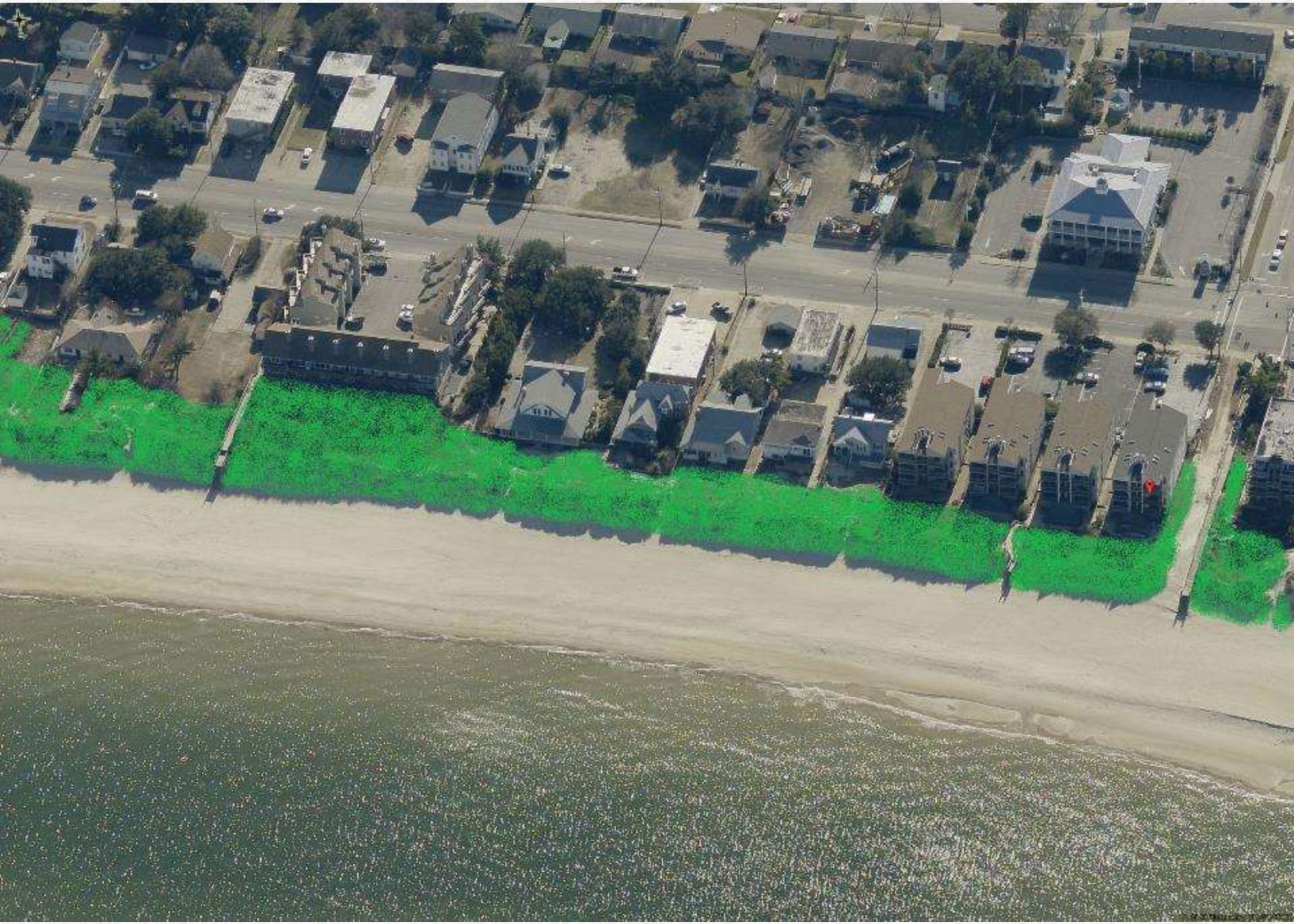

10/14/2008


6 19'95


1983
2014
Approximate Property Boundary

4 1 '85

4 1 '85




11/13/2009


11/13/2009


11/17/2009


11/17/2009


11/18/2009


Kiss
My Grits
Isabel
09 20 2003